Nutrigenomics: Proteomics Encounters Genomics

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From a technology perspective, nutrigenomics covers -omic, genetic and epigenetic platforms, with these being summarized under the overarching term “genomics” [1]; from a biological and physiological angle, the discipline addresses nutritionally actionable health conditions such as immune balance [2,3], energy metabolism [4], physical [5] and mental performance and digestive health [6].

We deploy the profiling techniques transcriptomics [7], proteomics [8] and metabonomics [1,9] to show nutritional efficacy and mechanisms; we use genetics to stratify cohorts enrolled in nutritional intervention studies [10,11]; and we explore epigenetics to improve our understanding of metabolic programming [10].

Proteomics is a central platform in our –omics set of profiling technologies and comes in two flavours [10,11]: as discovery and validation tool for biomarkers and for bioactives, i.e. peptide and protein ingredients. The nature of analysis has to be adapted to these two different types of tasks.

Using proteomics we are investigating: effects of low GI diets on weight maintenance [4]; development of early life intestinal [2] and systemic [3] immune competence; discovery of allergy biomarkers [12]; bioactives of milk [13] and probiotics [14].

At the new Nestlé Institute of Health Sciences (NIHS), proteomics is a central tool of our systems biology approach [15] to healthy ageing with a focus on metabolic, cognitive and intestinal health. NIHS pioneers nutrition and health science to develop integrated solutions within the triangle of food, pharma and diagnostics.

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